

Purpose of Study

Pacific cod (*Gadus macrocephalus*) is one of the largest groundfish fisheries in Alaska and is also a key predator in the Alaska marine ecosystem. During the winter, Pacific cod aggregate to spawn and at least some portions of the population undergo a large seasonal migration to summer foraging grounds. The primary purpose of this tagging study is to examine the seasonal movements of Pacific cod captured in the western Gulf of Alaska (WGOA) during the spawning season to better understand their connections with the wider Gulf of Alaska (GOA) and eastern Bering Sea (EBS) during the summer when the Alaska Fisheries Science Center (AFSC) bottom trawl surveys are conducted. A secondary purpose of this study is to collect biological information of the Pacific cod population from various fishing locations around the Shumagin Islands to provide data on age structure, length distribution, genetic origin, food habits, and spawning condition of the fish in the region.

March 2021 tagging

We worked with Captain Kiley Thompson (F/V Decision), a local fisher with detailed knowledge of fishing grounds, to tag Pacific cod with both satellite and conventional tags in the Shumagin and Sanak Island areas (Figure 1) during March 2021. Satellite tags constantly record depth, temperature, and light data when the fish is at liberty. After the tags release from the fish and "pop up" to the surface, the Argos satellite network obtains their location and the data transmitted by the tags can be used

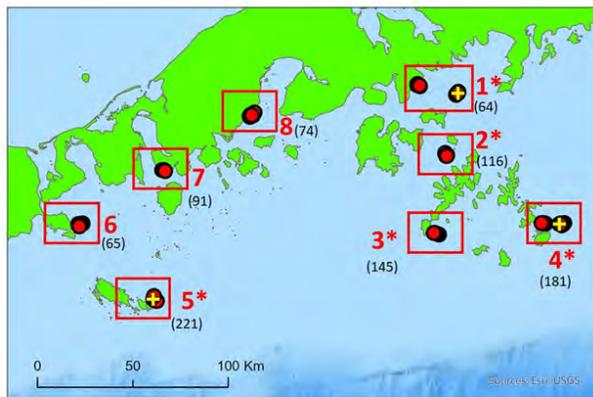


Figure 1. The 8 study areas and numbers of conventional tags released (in parentheses) in the Western Gulf of Alaska. Areas with stars indicate release of 5 satellite tags per area. Yellow crosses denote stationary tag locations.

to estimate travel paths of tagged fish. Satellite tags were programmed to pop up after 90, 180, and 365 days. We released 25 satellite tagged Pacific cod and 957 conventionally tagged Pacific cod in 8 subareas of the larger study area (Figure 1). In addition, we collected 155 biological specimens for length, weight, age structure, genetic samples, maturity and stomach content. We collected length and maturity information from 183 fish.

Summer 2021 Update

By the end of July of 2021, we received locations for 16 satellite tagged fish and 5 conventionally tagged fish (Figure 2). While some tagged fish remained in the release area through June, others moved more than 1000 km to Bristol Bay, the northern Bering Sea, and Russia. These preliminary results indicate that the WGOA and the Bering Sea regions are connected through seasonal migration.

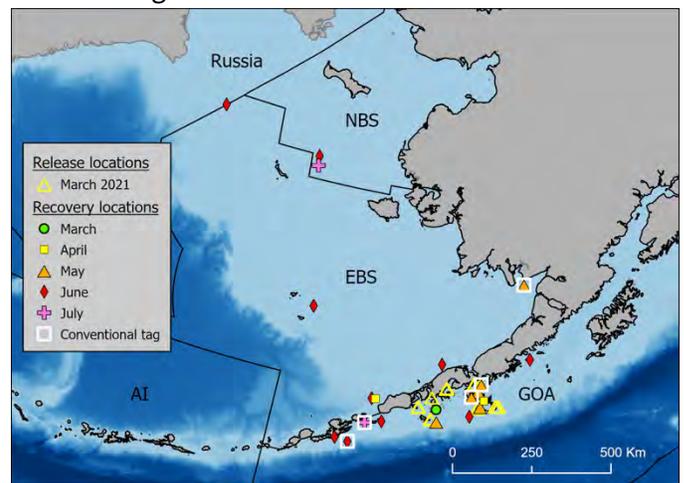


Figure 2. Monthly satellite and conventional tag recovery locations through July 2021 by region (NBS = Northern Bering Sea, EBS = Eastern Bering Sea, AI = Aleutian Islands, and GOA = Gulf of Alaska). White boxes around colored symbols indicate recovery of conventional tags.

Next Steps

Work is on-going to estimate travel paths for fish that have provided data from satellite tags so far. This will provide information on migration pathways and timing. Additional tagging updates will be provided after the September and March pop-up dates. Information on movement between management regions obtained from this study will be considered by stock assessors and fisheries managers. We anticipate conducting another round of tagging and biological sampling in the WGOA during the next spawning season around March 2022.

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